

## NOTES ON GEOGRAPHIC DISTRIBUTION

### Mammalia, Artiodactyla, Cervidae, *Blastocerus dichotomus*, municipality of Barreiras do Piauí, State of Piauí, Northeastern Brazil: Distribution extension

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The marsh deer *Blastocerus dichotomus* (Illiger, 1815) is the largest cervid species in South America. Females and males weight up to 100 kg and 130 kg respectively. The species inhabits marshlands and riparian habitats (Eisenberg and Redford 1999; Nowak 1999; Pinder and Grosse 1991). The reddish body pelage and the blackish distal parts of the limbs are important diagnostic characters of the species. Male specimens have impressive branched antlers, which may exceed 10 tips (Duarte 1996; Figure 1).

Several authors mentioned a large historical range of *B. dichotomus* that extended from southern Amazonia to northern Argentina, including part of northeastern Brazil under semi-arid conditions in the *Caatinga* domains (Pinder and Grosse 1991; Tomas et al. 1997). Nevertheless, the current range of the species was estimated to be only 35 % of the original one by Weber and Gonzalez (2003), due to poaching, cattle diseases, habitat loss to agricultural activities, and dam construction (Beccaceci 1994; Duarte 2001; Pinder and Grosse 1991; Tomas et al. 1997).

As a result, the current populations of marsh deer are small and isolated. In Brazil, populations of marsh deer have been found in the *Pantanal* region in the states of Mato Grosso and Mato Grosso do Sul; in the fluvial island of Bananal at Tocantins River, states of Mato Grosso and Tocantins; along the Guaporé River in the state of

Rondônia; and in marshlands along the Paraná River in the states of Mato Grosso do Sul, Paraná, and São Paulo (Tomas et al. 1997).

The fact that the marsh deer populations are reduced and isolated led experts to consider it as a species threatened with extinction both in Brazil (MMA 2003) and worldwide (IUCN 2007). In this report we provide the first empirical record of *B. dichotomus* for the marginal *Cerrado* (Brazilian savannas) in northeastern Brazil, specifically in the Nascentes do Rio Parnaíba National Park (NRPNP).

The NRPNP was recognized as a Federal Reserve in July 2002. It has 729.813 ha and is located in the southern part of Piauí and Maranhão states, and northern part of Tocantins and Bahia states, in northeastern-central Brazil (Figure 2). It encompasses the headwaters of the Rio Parnaíba, which is the second most socially and economically important river in northeast Brazil. According to Nimer's (1972) climate classification, our study area is located in the transitional zone between the Amazonian equatorial moist climate and the Brazilian northeastern semi-arid climate. Rainfall is around 1300 mm/year, with rainy season from December to February, and dry season from March to November (Emperaire 1983). The vegetation cover is cerrado, where periodically flooded grassy fields predominate. Other vegetation types

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found in the NRPNP are grassy marshlands, palm marshlands, gallery forests, “cerrado sensu stricto”, and tall cerrado (Santos 2001). Available

information about its fauna is restricted to primates and birds (Flesher 2001 and Santos 2001 respectively).



**Figure 1.** Female (right) and male (left) adults of *Blastocerus dichotomus*. Photographs provided by J. M. B. Duarte.

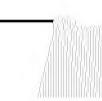
During a field trip to the NRPNP that took place in October 1999, one of the authors (M.P.D. Santos) found a carcass of an adult female specimen of *B. dichotomus* in a forest area known as Brejo da Porteira ( $10^{\circ}06'08''$  S,  $45^{\circ}46'58''$  W), located in the municipality of Barreiras do Piauí, state of Piauí. The rump and abdomen of the carcass were missing, and the remaining parts were partially covered with leaves, which are evidences of its predation by the large felid *Puma concolor* (Oliveira and Cavalcanti 2002). We collected the skull from the carcass and deposited it in the mammal collection of the Museu Paraense Emílio Goeldi (MPEG 30693; Figure 3).

As it was mentioned before, many authors stated that *B. dichotomus* was originally found in the north region of the *Cerrado* domain, including the southern portion of Piauí and Maranhão states.

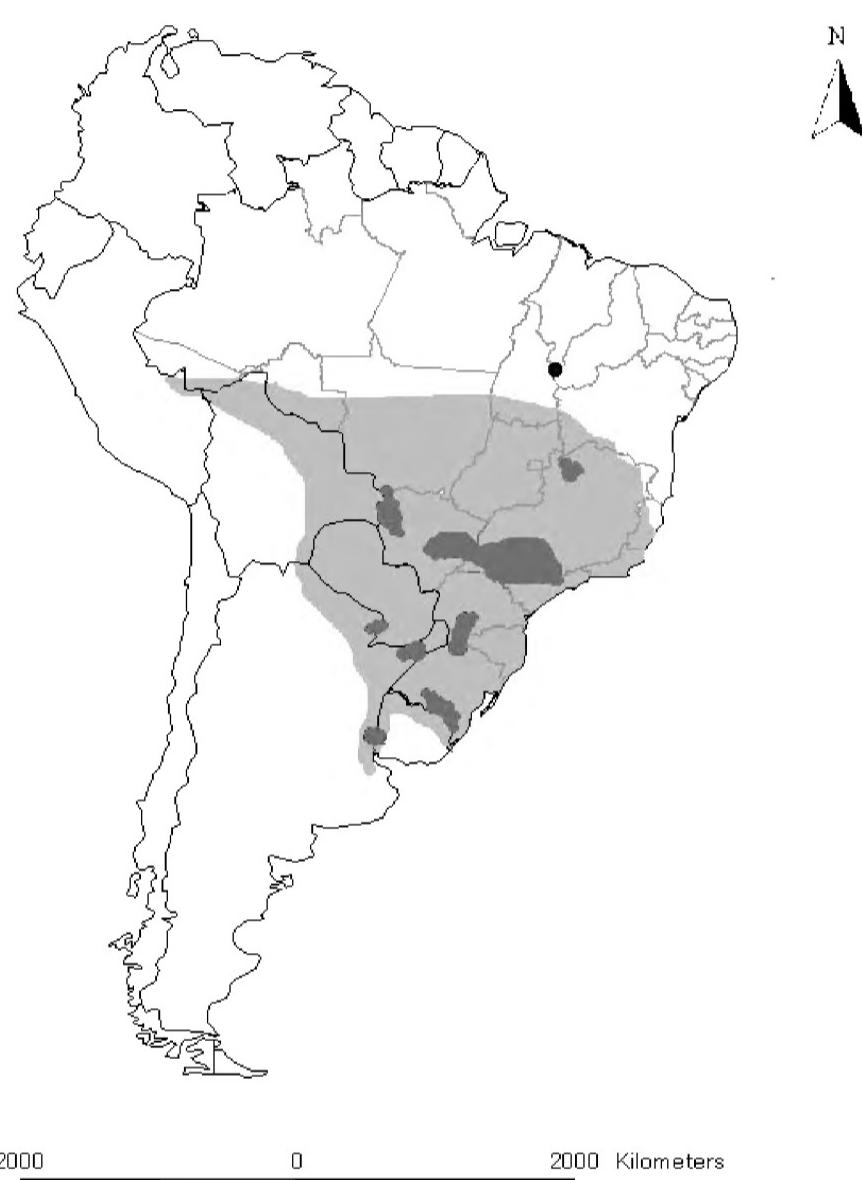
However, Tomas et al. (1997) believed that the marsh deer might be extinct from these states. Our record shows that this species is not extinct in that region, and it represents a 530 km extension to the north of its historical geographic distribution area, as proposed by Weber and Gonzalez (2003; Figure 2).

Among those factors associated to the decrease number of marsh deer populations stated above, hunting and habitat alteration might be the major threats to the NRPNP population. In the single available study on hunting activity for the southern part of Piauí and Maranhão states, specifically in the *Serra da Capivara* National Park, Miranda and Alencar (2007) stated that people living close to this park have a strong tradition of hunting activity, aiming to supply the surrounding cities with meat of hunted animals. Given the proximity of the *Serra da Capivara*

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National Park with the NRPNP, it is possible that hunting is also present in the latter. Additionally, we have heard from inhabitants of the surrounding NRPNP that the meat of *B. dichotomus*, popularly known as *suçupara*, is much appreciated. These facts make us to believe that hunting activity may represent an effective threat to this species in the region.



**Figure 2.** Historical (light gray) and current (dark gray) geographic distributions of *Blastocerus dichotomus*, and the location of Nascentes do Rio Parnaíba National Park (point). Map extracted from Weber and Gonzalez (2003).

Similar to other marginal areas in the *Cerrado* bioma, the south region of the Piauí and Maranhão states have been suffering a process of habitat modification mainly due to the expansion of agricultural fields (Castro and Martins 1999; Klink and Machado 2005; Machado et al. 2004; Nepstad et al. 1997). The region has been occupied on a fast rate since 1990 by the implantation of big projects on grain growth,

mainly soy bean. Such activities are motivated by low values in both land market and local labor work, and by governmental resources in the form of tax incentives (Aguiar and Monteiro 2005). Public administrators support these projects on behalf of economic growth and social inclusion, because it creates jobs and income for the population. However, Aguiar and Monteiro (2005) had concluded that although it may lead to economic growth, the implanted agricultural model has been promoting the concentration of wealth and lands to a small part of the population, leading to some social exclusion and damages to the environment.

In addition to the factors mentioned above, there are serious conflicts related to land properties in the NRPNP region. These conflicts, allied to the undefined condition of territorial limits between the states of Piauí and Tocantins, have led part of the population to claim for the extinction of this Federal Reserve, despite its importance for fauna, flora, and headwaters conservation.

Our record of *B. dichotomus* in the NRPNP evidences that the mammal fauna of northeastern-central Brazil is still poorly known, and supports the status of “high priority for conservation” recently assigned to this part of the *Cerrado* biome (MMA 2002). As the region is going through fast habitat changes due to agricultural and cattle activities, we strongly recommend that general faunal inventories be carried out in the NRPNP, in order to provide data to support management plans of an adequate use and conservation of this Federal Reserve.

Also, the conservation status of the marsh deer in the NRPNP and surrounding areas must be assessed with inventory studies focused on local population size, number, and spatial distribution. Information on habitat availability and extension in the region is not available and need to be determined. Finally, local threat factors (hunting and habitat loss) for the species must be characterized and dimensioned in order to evaluate their effective impact on local populations.

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**Figure 3.** Lateral view of the skull of *Blastocerus dichotomus* (MPEG 30693) found in *Nascentes do Rio Parnaíba* National Park, Brazil. Bar = 10 cm.

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